SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Northern Everglades River Watershed Research & Water Quality Monitoring Program

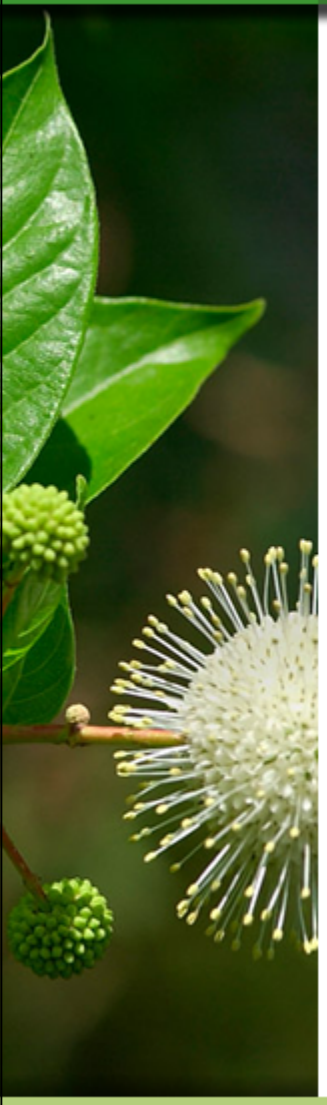
St. Lucie River Watershed

March 28, 2008

sfwmd.gov

UPDATES

- Research and Monitoring Plan
- Chapters 1 through 3 - Draft chapters are completed
- Chapter 4 - Watershed and Estuarine Monitoring Program
  - Description of Existing Monitoring: Flow, Water Quality, Salinity and Aquatic Habitat- draft completed
  - Assessment of Monitoring: Is it adequate to meet goals? – on-going



All Stations

Watershed Flow and WQ: WQM of the District (7 stations)

Tributary Flow and WQ: SLT of the District (19 stations)

Estuary Water Quality: SE of the District (13 stations)

Estuary Salinity: SA of the District (8 stations)

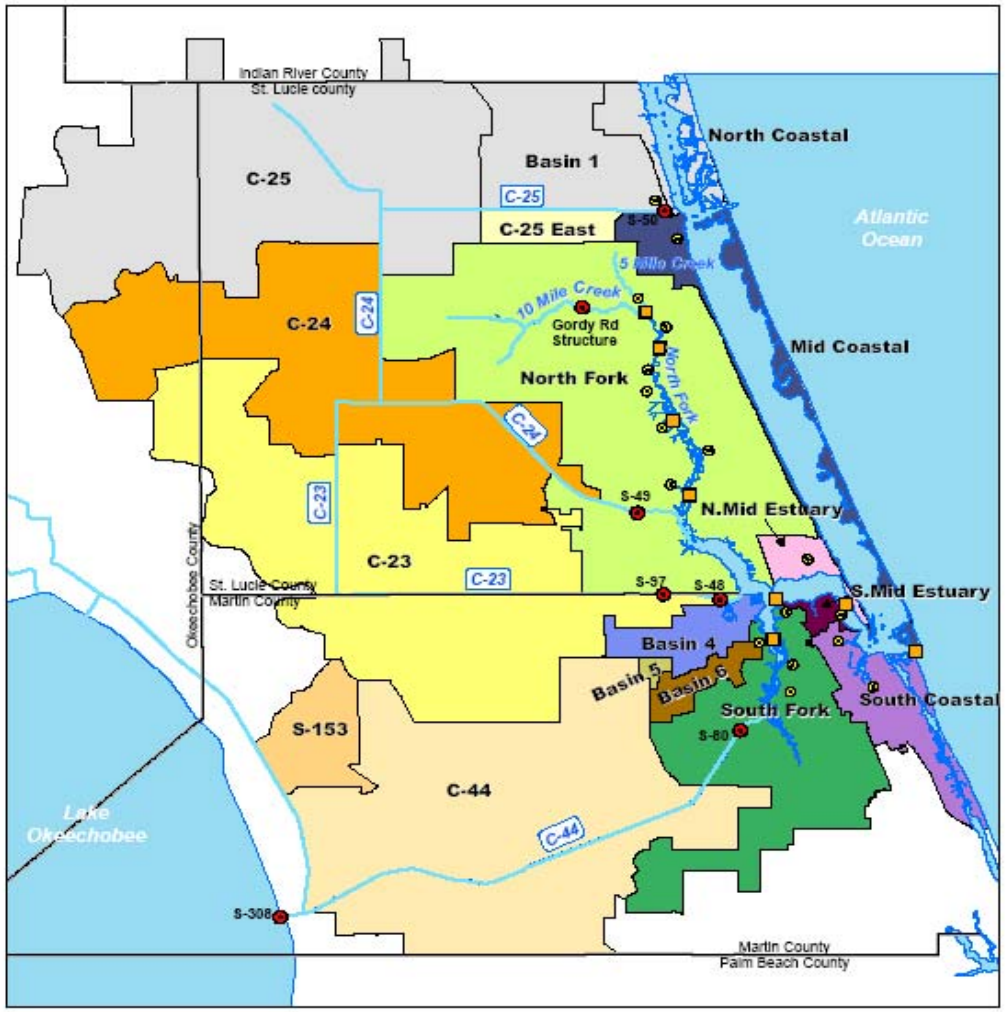
Estuary Bacteria: 14 stations of St. Lucie County

FDEP: 16 stations

UF/IFAS: 22 stations from 2002-2005

Existing Water Quality Monitoring Inventory

Organization	Number of Stations	Location	Frequency	Period	Analytes
SFWMD/WQM	7 (Fixed)	SLE Watershed District Structures	Monthly for WQ, Daily for flow	1982 - Present	Temp, pH, Cond, DO, CR, Mg, NH4, NOx, TKN, PO4, TotAS, TotCU, TP04 TSS, Turb, Flow
SFWMD/SE	13 (Fixed)	SLE	Monthly	1991 - Present	TP, TKN, NOx, NH4, NO2, oPO4, Color, Pheo., TSS, VSS, Turb, Chla, Cha2, Light Attenuation, Salinity, DO, pH, Temp., Depth, Secchi
SFWMD/SLT	19; Flow (12), Rainfall (8)	SLE Tributary including North Fork, South Fork, Bessey Creek, & Danforth Creek Basins	Water Quality- Biweekly Flow/Rain - Continuous	2001 - Present	Temp, pH, Cond, DO, CR, Mg, NH_4, NOx, TKN, TotAS, TotCU, TPO4 TSS, Turb, Flow, Rain
SFWMD	8 (In-situ)	SLE	15 minutes	1997 - Present	Near surface and bottom conductivity/salinity and temperature with water level, velocity, and DO at some stations
SFWMD	5 (Event)	St. Lucie when blue-green algae is present	As required	2005 - Present	Chl-a, microcystin
FDEP	16 (Fixed); 3 (In-situ)	SLE & Watershed	Monthly	3/2008 - 4/2008	10 Estuary sites; 6 Upland sites; BOD, CBOD, Alkalinity, NH4, Chl-a, Color, NOx, oPO4, TKN, TP, TDS, TOC, TSS, and Turb., In-situ at 3 stations (DO, pH, Specific Conductivity, Temp., Depth)
St. Lucie County	14 (Fixed)	SLE & Tributary	Monthly	2005 - Present	Fecal Coliform, Enterococci, Salinity, Temp, DO, pH and Nutrients may be added TBD
UF/IFAS	22 (Fixed)	Watershed (Primarily Citrus Land Use)	Biweekly	2002 - 2005	CU, TP, DO, TSS, TN, pH, EC, oPO4, TP, Rainfall, Depth, Flow



St. Lucie Estuary Primary Basins and Water Quality Monitoring Sites

* C-25, Basin 1, and North Coastal Drainage Basins Flow directy into the Indian River Lagoon

- SFWMD WQM Sites
- St. Lucie Urban Tributary Monitoring (SLT)
- St. Lucie Estuary Water Quality Monitoring (SE)
- SFWMD Stage & Salinity Recorders

0 1 2 4 6 8 10
Miles

District Monitoring Stations

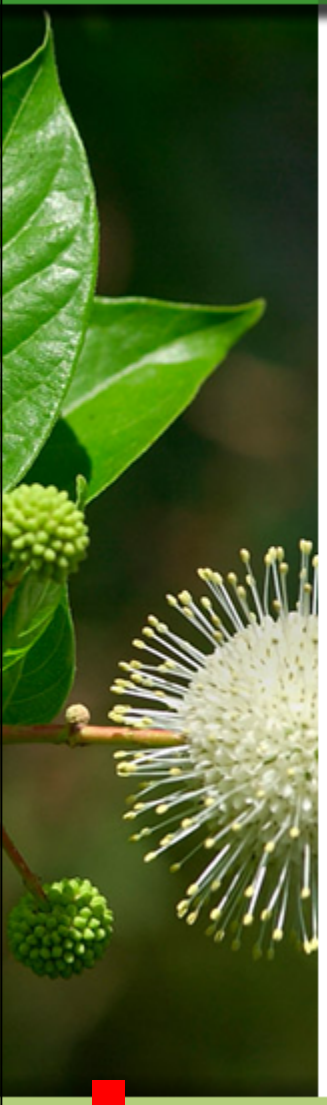
Watershed Flow and WQ: WQM of the District (7 stations)

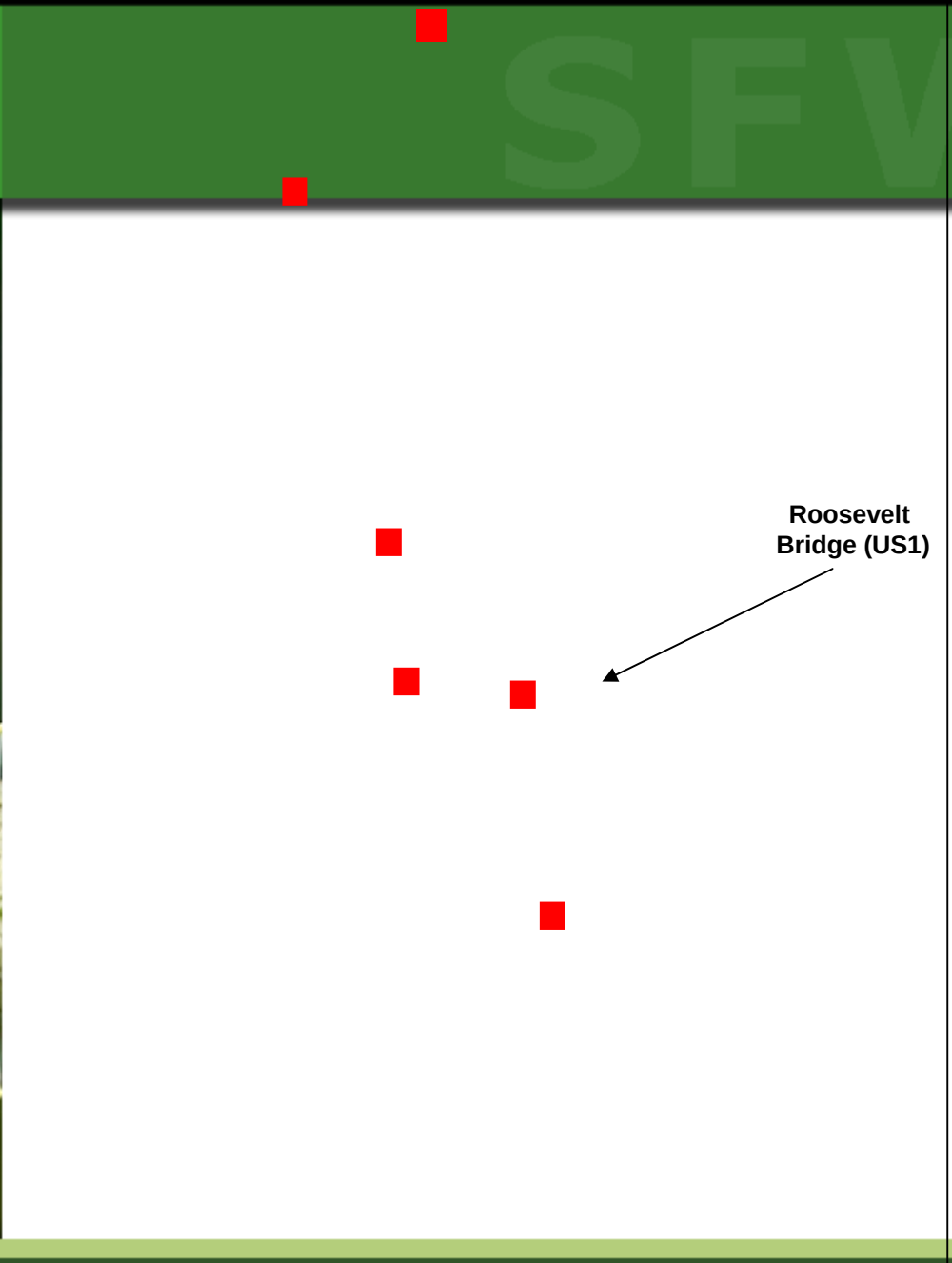
Estuary Water Quality: SE of the District (13 stations)

Tributary Flow and WQ: SLT of the District (19 stations)

Estuary Salinity: SA of the District (8 stations)

WQM Stations



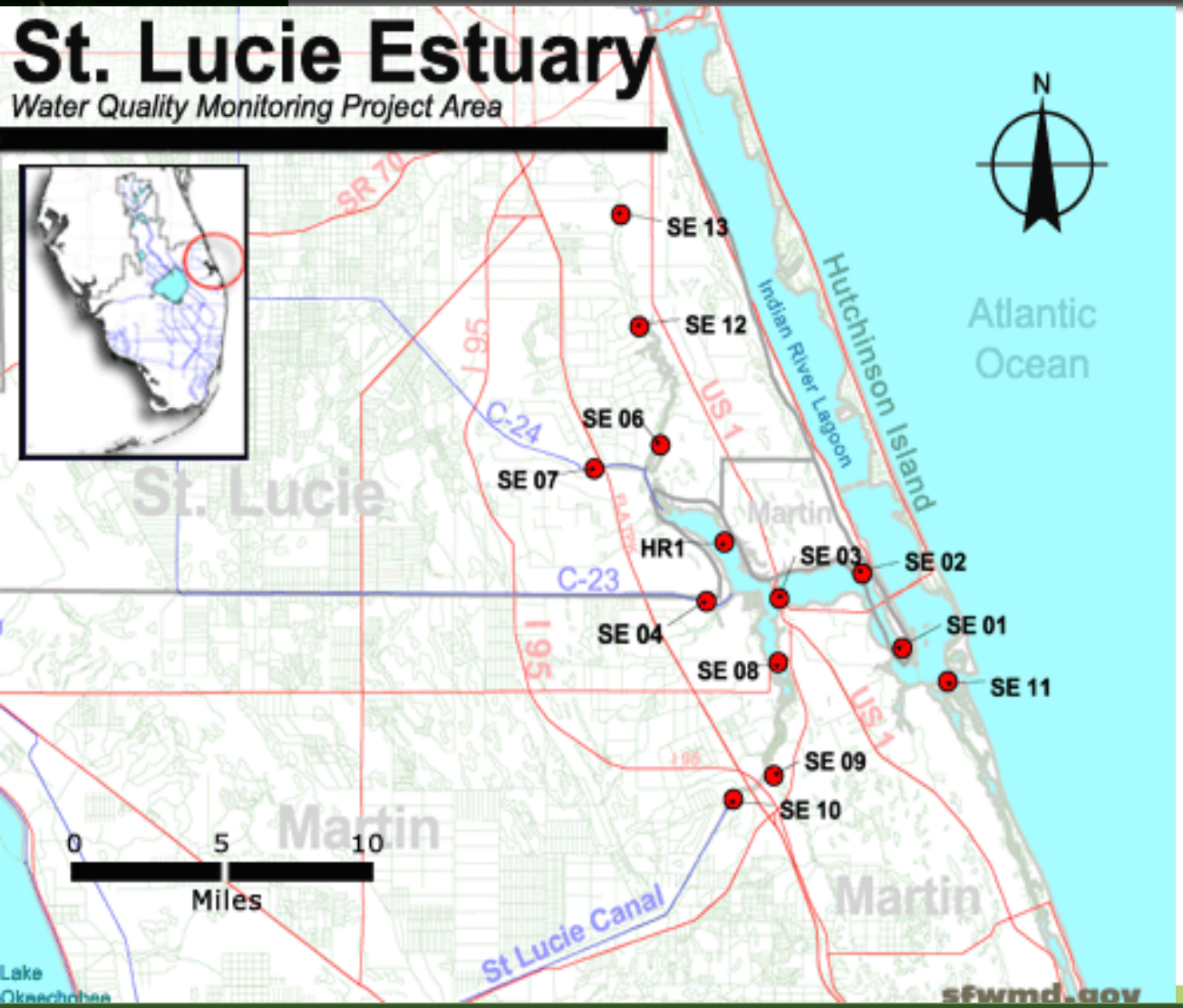


Flow – Continuous

Monthly WQ:

- Temp, pH, Cond, DO, Color,
- Cr, Mg, TotCU, TotAS
- NH4, NOx, TKN, TPO4, PO4, TSS, Turb,

SE Water Quality Stations



Monthly WQ:

- TP, TKN, NOx, NH4, NO2, PO4,
- Color, Pheo., TSS, VSS, Turb, Chla, Cha2, Light Attenuation,
- Salinity, DO, pH, Temp., Depth, Secchi

SLT Stations

Flow/Rain – Continuous
(13 of the 19 sites)

Biweekly WQ:
Temp, pH, Cond, DO,
Color, NH4, NOx, TKN,
TPO4, PO4, TSS, Turb,

Monthly WQ:
Cr, Mg, TotCU, TotAS,
Hardness

- SFWMD WQM Sites
- SFWMD St. Lucie Urban Tributary Monitoring (SLT)
- SFWMD St. Lucie Urban Tributary Monitoring With Flow (SLT)

SLE Watershed Landuse

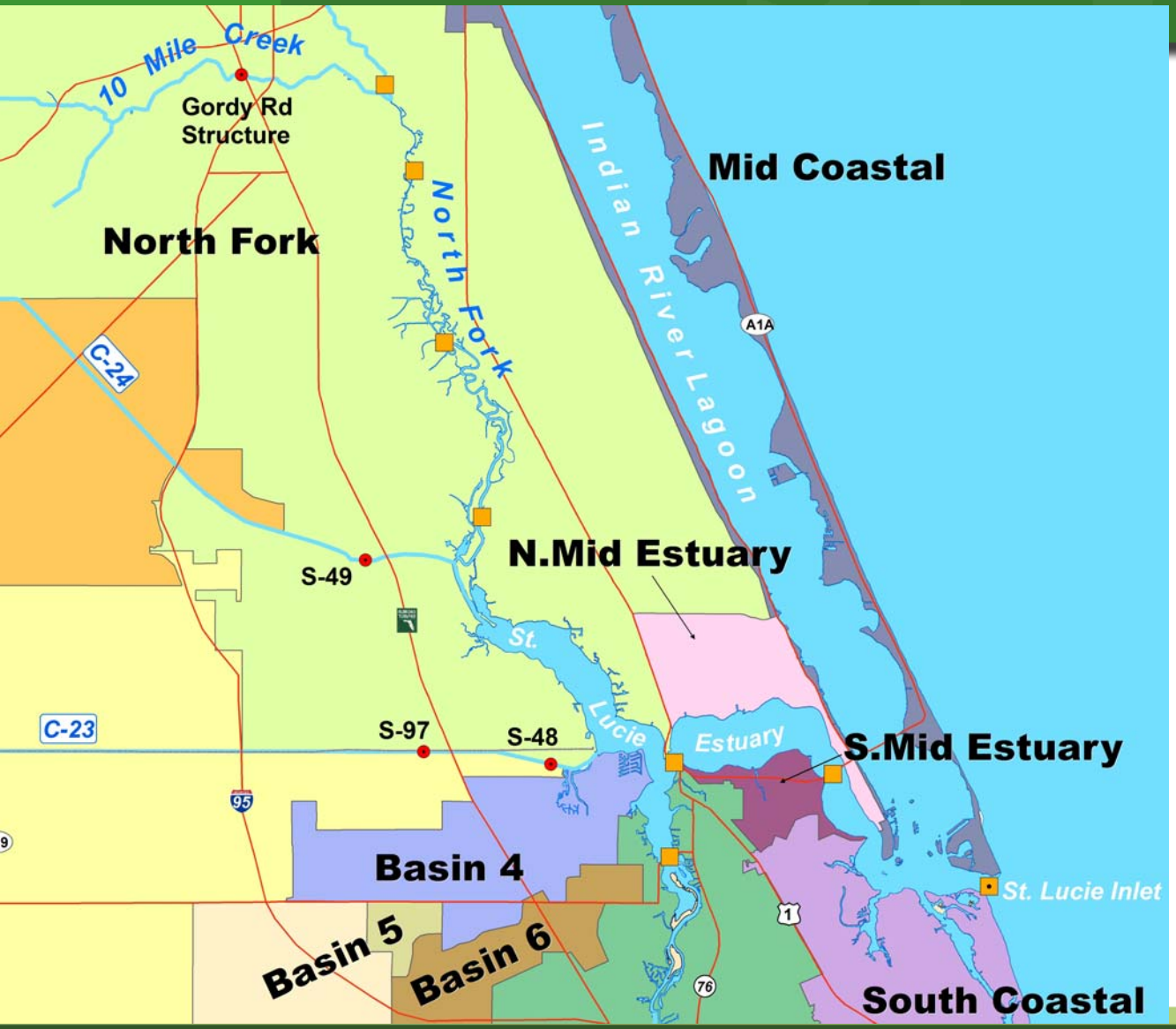
Land Cover

- Urban
- Agricultural
- Rangeland
- Upland Forested
- Water
- Wetlands
- Barren
- Communication/Utilities
- Transportation
- C-44 Primary Basins

SLT and WQM Stations

- SFWMD WQM Sites
- SFWMD St. Lucie Urban Tributary Monitoring (SLT)
- SFWMD St. Lucie Urban Tributary Monitoring With Flow (SLT)

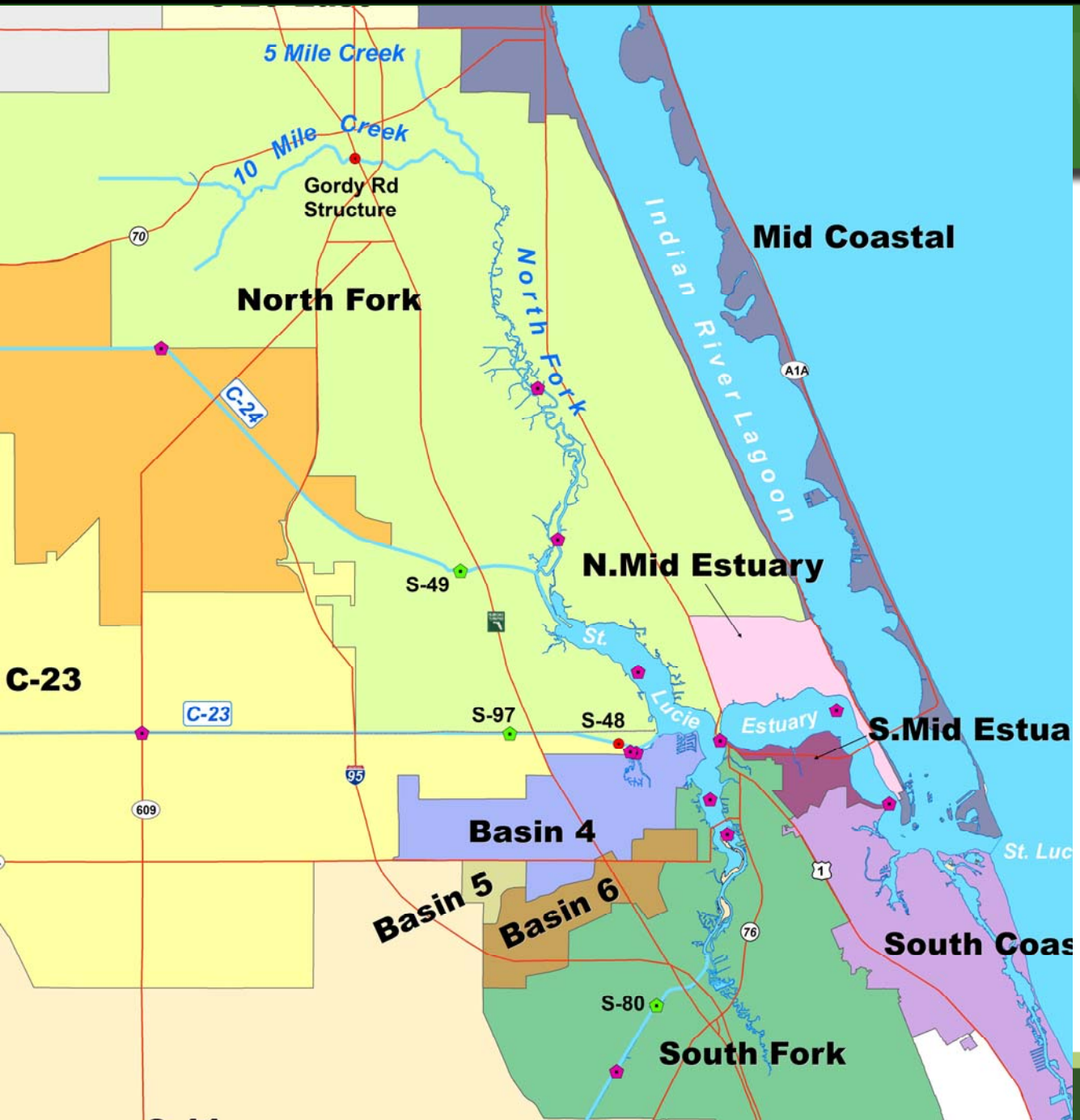
SLE Salinity Stations



15-Minute Salinity, Tide, and Temperature Measurements

Short-Term Water Quality Monitoring Stations

- Estuary Bacteria: 14 stations of St. Lucie County
- FDEP: 16 New Stations
- UF/IFAS Canal Watch: 22 Stations from 2002-2005

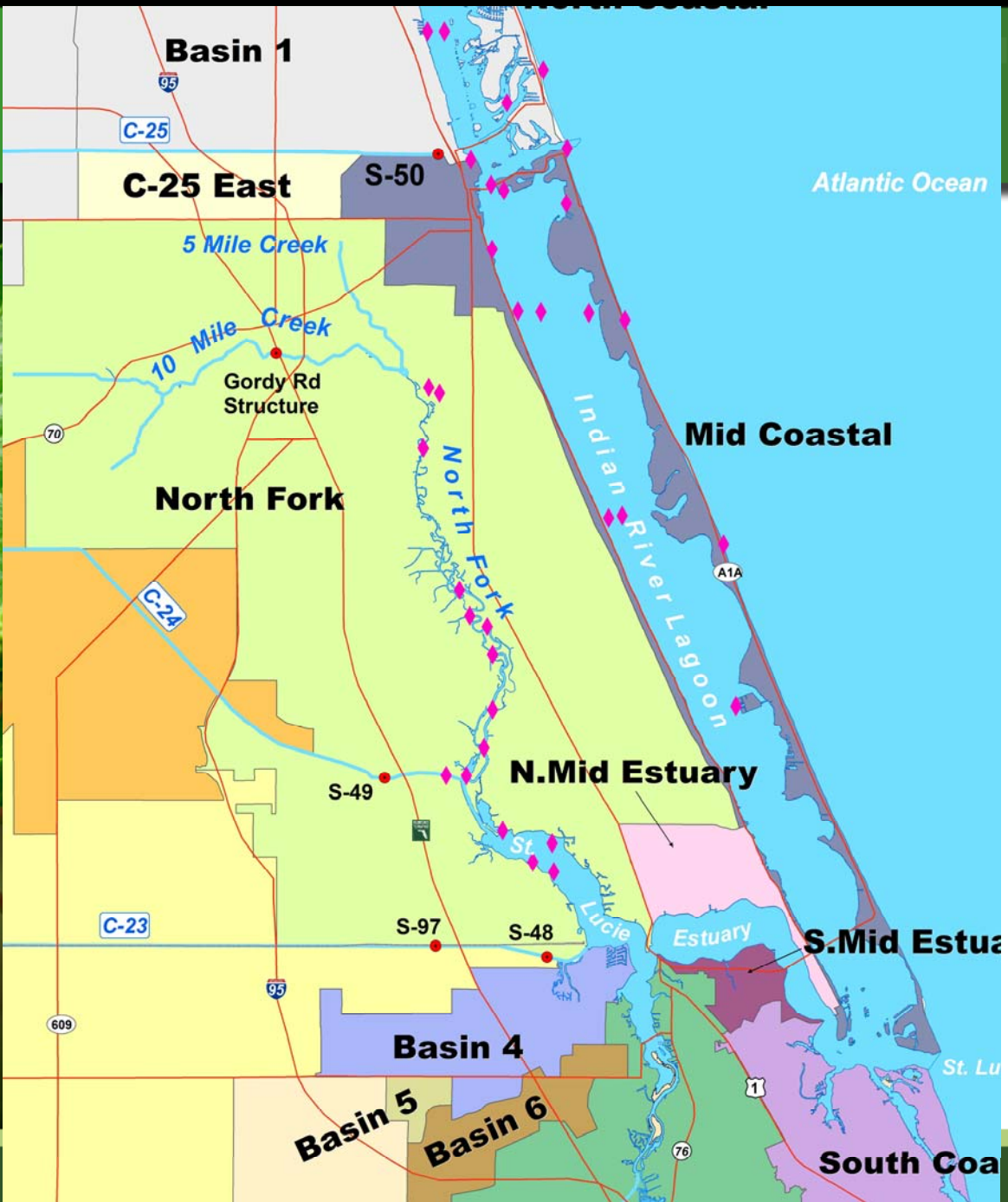


FDEP New Stations

10 Estuary Stations
6 Upland Stations

- BOD, CBOD
- Alkalinity, Chl-a, Color
- NOx, PO4, TKN, TP, NH4
- TDS, TOC, TSS, Turbidity

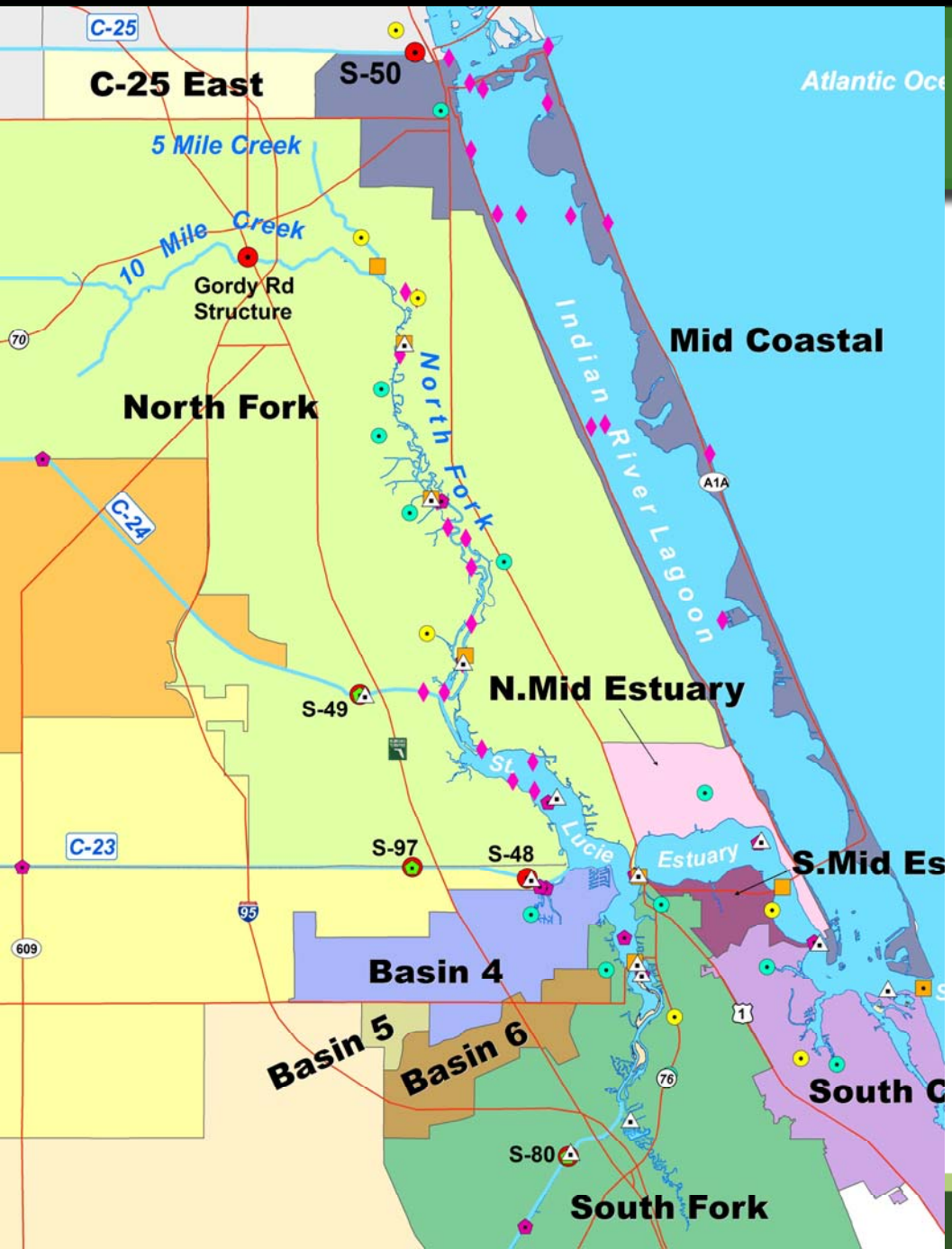
FDEP Monitoring Monthly Grabs
FDEP Monitoring In Situ



St. Lucie County Stations

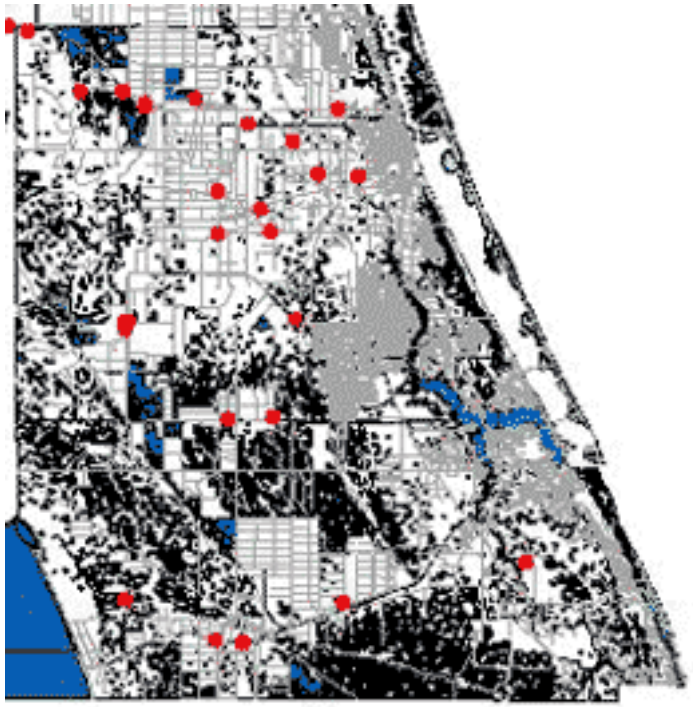
Fecal Coliform, Enterococci, Salinity, Temp, DO, pH and Nutrients may be added TBD

Nutrient Stations & St. Lucie County Stations



- SFWMD WQM Sites
- SFWMD St. Lucie Urban Tributary Monitoring (SLT)
- SFWMD St. Lucie Urban Tributary Monitoring With Flow (SLT)
- SFWMD St. Lucie Estuary Water Quality Monitoring (SE)
- St. Lucie County Monitoring Sites
- FDEP Monitoring Monthly Grabs
- FDEP Monitoring In Situ

UF/IFAS Canal Watch



Biweekly & Primarily Citrus Land Use (2002-2005)

- TP, TN, oPO4
- DO, TSS, pH, EC,
- Rainfall, Depth, Flow

Proposed List of Parameters for Long-Term Monitoring

Group A Priority Parameters for WQ Monitoring

- TN (cal), NH4, NO2/ NO3, TKN, DON (cal), DTKN
- TP, OPO4= SRP
- DO, BOD5
- Chl-a (estuary monitoring exist)
- TSS
- Turbidity
- Color
- Total hardness
- Iron
- Copper
- Lead
- Arsenic
- Zinc

Blue: all WQM stations and SLT stations

Green: additional parameters

Proposed List of Parameters for Long-Term Monitoring

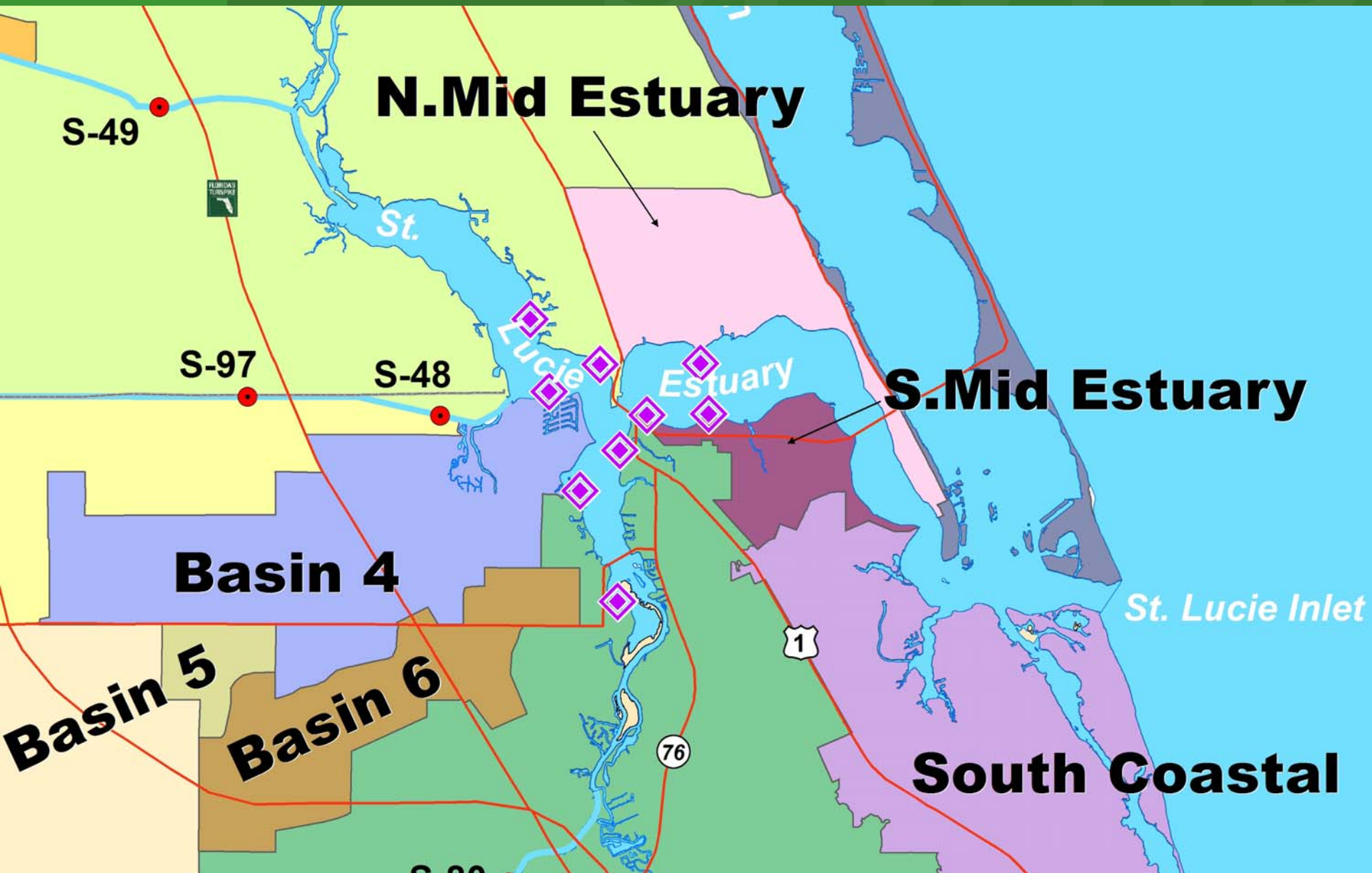
Group B - Additional Parameters (at specific location and frequency)

- Fecal Coliform

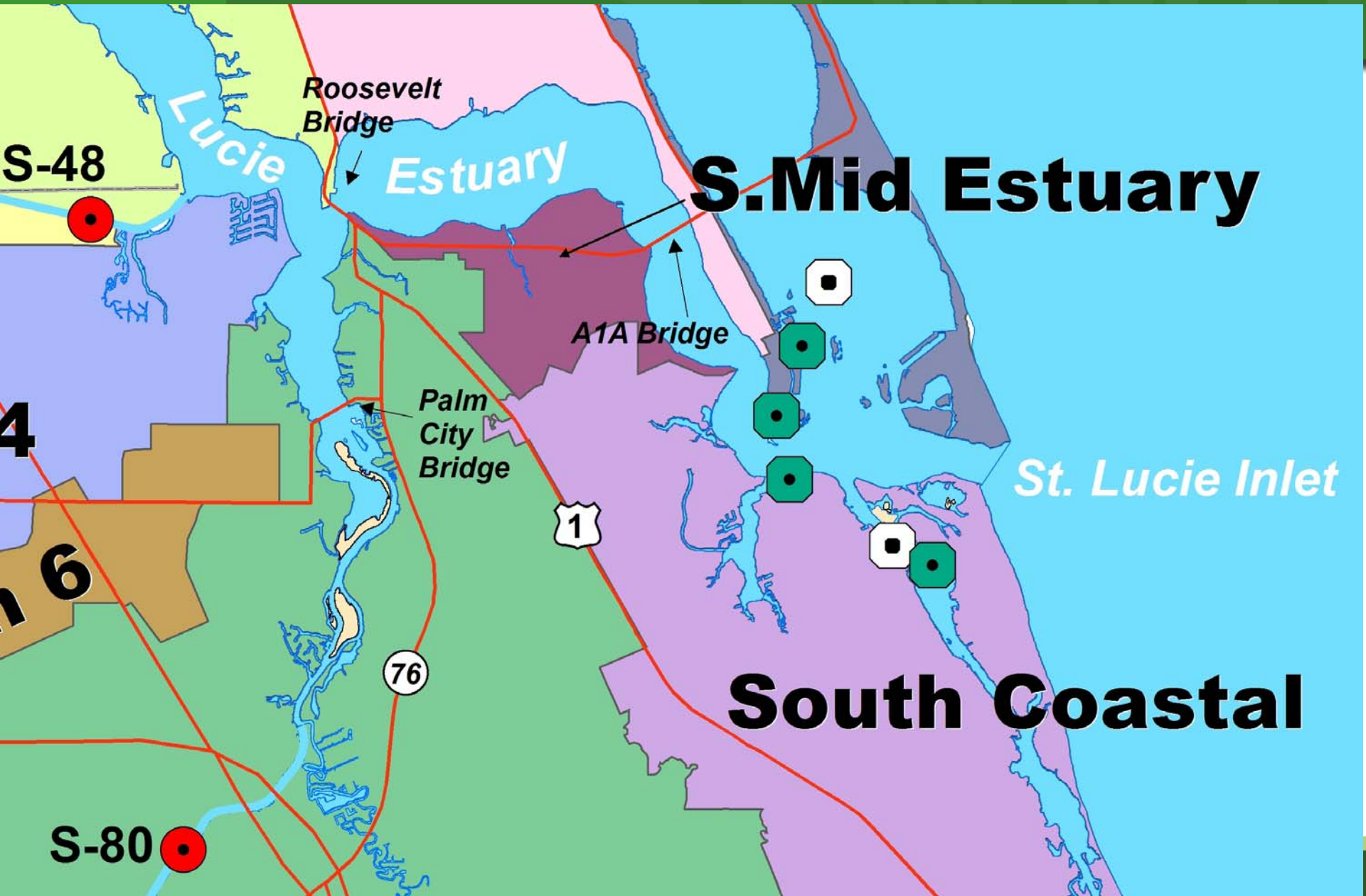
SLE (Estuary) Physical Parameters

- **Physical parameters – SLE (estuary stations)**
  - **PAR**
  - **Salinity**
  - **Temp**
  - **pH**
  - **Conductivity**
  - **Secchi**
  - **DO (top and bottom)**
  - **Total depth**
  - **Weather**
  - **Rain**

St. Lucie Oyster Stations



St. Lucie Seagrass Stations



Next Steps

- Ad-hoc group meeting for assessment regarding Tributary (SLT) monitoring
- Aquatic habitat existing monitoring inventory
- Research inventory
- Budget cost estimate